



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>5</sup> :</b>  <b>B65D 25/16</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 93/14984</b>  <b>(43) International Publication Date:</b> <b>5 August 1993 (05.08.93)</b>
<b>(21) International Application Number:</b> PCT/NL93/00027 <b>(22) International Filing Date:</b> 26 January 1993 (26.01.93)  <b>(30) Priority data:</b> 9200148                      27 January 1992 (27.01.92)      NL  <b>(71) Applicant (for all designated States except US):</b> KONINKLIJKE EMBALLAGE INDUSTRIE VAN LEER B.V. [NL/NL]; P.O. Box 25, NL-1180 AA Amstelveen (NL).  <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only) :</b> KARS, Herman, Paul [NL/NL]; A.M. de Jonglaan 37, NL-1422 GJ Uithoorn (NL).  <b>(74) Agent:</b> DE BRUIJN, Leendert, C.; Nederlandsch Octrooibureau, Scheveningseweg 82, P.O. Box 29720, NL-2505 LS The Hague (NL).		<b>(81) Designated States:</b> AU, BR, CA, FI, JP, NO, NZ, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> LINING, METHOD FOR FITTING SAID LINING AND ASSEMBLY COMPRISING A LINING AND A VESSEL <div style="text-align: center;"> </div>		
<b>(57) Abstract</b>  <p>Lining which can be installed in a vessel (2) so that the vessel can be completely emptied and in order to prevent corrosion. In this manner, the vessel may be used several times. The lining consists of two combined parts, namely an expandable bag (3) and a fastening ring (4) which is fastened thereto. The construction of the fastening ring is such that this lining can be applied to all vessels used in the state of the art. To this end, the fastening ring is produced in a U shape. One leg (6) of the U is connected to the bag. The body (7) of the U lies on the edge (8) of the mouthpiece of the vessel, whilst the other leg is intended to lie against the mouthpiece (10) of the vessel. In particular, a temporary but strong connection can be provided by folding the other leg.</p>		

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Lining, method for fitting said lining and assembly comprising a lining and a vessel.

The invention relates to a lining which can be installed in a vessel and removed therefrom, comprising a flexible, expandable bag intended to lie against the wall of the vessel, and which is fastened to a rigid fastening ring near the mouth of the latter, which ring can be fastened to the vessel and is provided with means for detachably fitting a sealing stopper.

A lining of this type is disclosed in PCT publication WO/88/08401. In said document, the fastening ring consists of a sleeve which, on the underside thereof, is provided, on the one hand, with a groove in which to receive the bag and, on the other hand, is provided with an external screw thread. The vessel associated therewith is provided with a flat lid in which an opening is fitted, provided with an internal screw thread. The free end of the sleeve is provided with an internal screw thread into which a stopper can be fitted.

Although a construction of this type, as such, will be satisfactory, it has a number of drawbacks. Firstly, it is necessary to manufacture special vessels for linings of this type, the vessels being provided with the abovementioned internal screw thread. If a construction of this type is to be applied in a vessel with a projecting mouthpiece, the considerable length of the part of the fastening ring which projects above the vessel opening provided with a screw thread would give rise to an extremely long mouthpiece. Given the increasingly stringent requirements which are applied to vessels and, more particularly, in drop tests, a long mouthpiece of this type will almost always lead to failure.

If the screw thread in question were fitted in a flat lid of the vessel, as is shown, particularly, in the figures of this PCT application, a considerable wall thickness is necessary, with the concomitant waste of material, higher outlay and increase in weight of the vessel.

The object of the present invention is to reduce these drawbacks and to provide a lining which can be used, without special measures, in all vessels which are known in the state of the art and which are provided with a projecting mouthpiece.

This aim is achieved with an above-described lining in that the fastening ring comprises a U-shaped part, one leg thereof being fastened to the bag, the body thereof being designed so as to lie against the upper edge of a projecting mouthpiece of the vessel and the other leg

being designed to lie against the mouthpiece.

The U-shaped design of the fastening ring will increase the projecting height of the mouth only by the thickness of the material of the fastening ring, possibly augmented by a seal used therewith. An  
5 increase of this type in the projecting part is, however, of minor importance. The leg which is not fastened to the bag can be used to fasten the lining to the vessel. This fastening can, for example, be achieved by folding. The leg which is connected with the lining can, moreover, be provided with a screw thread for accepting a sealing plug of special  
10 design.

Although the fastening ring can be fastened to the vessel in every manner known in the state of the art, such as by clamping, the upper part of the fastening ring, according to an advantageous embodiment of the invention, is made from metallic material, particularly to obtain  
15 a construction which is somewhat flexible and easy to fold, and the lower part is produced from plastic material which can easily be connected to the material of the bag.

The construction according to the invention guarantees that hardly any differences arise in drop tests and other safety trials in  
20 comparison with the existing vessel construction. That is to say that the lining now proposed has no fundamental influence on the mechanical properties of the vessel and can be used without too many problems. This will undoubtedly promote the use of linings of this type and lead to a larger degree of vessel recycling.

25 A method for fitting a lining in a vessel comprises providing a lining as described above, installing the bag in the vessel via an opening, followed by the fastening ring of the lining and the fastening of a leg of the fastening ring, by folding, to the mouthpiece of the vessel.

30 The invention also relates to an assembly comprising an above-described lining in combination with a standard vessel which is provided with at least one mouthpiece.

The invention will be explained hereinafter on the basis of an illustrative embodiment described in further detail in the drawing. In  
35 the drawing:

Fig. 1 shows, diagrammatically and in partial cross section, a standard vessel provided with the lining according to the invention;

Fig. 2 shows the lining according to the invention;

Fig. 3 shows a first part of the insertion stage of the lining

according to the invention; and

Fig. 4 shows a detail of the vessel after installation of the lining according to the invention.

A vessel used in the state of the art is indicated overall by 2 in Fig. 1. This vessel can have every shape known in the state of the art and, in order to understand the invention, it is of interest only that said vessel is provided with a mouthpiece 10. Although this is illustrated, in the figures, in the centre, the invention can be used in out-of-centre mouthpieces and vessels with a filling mouthpiece and a bleeding mouthpiece.

The lining 1 according to the invention is shown in Fig. 2. This lining consists of a flexible unfoldable bag 3 whose mouth is delimited by a fastening ring 4 which is pictured in greater detail in Fig. 3. This shows that said fastening ring 4 consists of a U-shaped part with a leg 6, body 7 and further leg 9. As appears from a comparison of Figs 3 and 4, leg 9 can provide the fastening to the mouthpiece 10 by means of folds. Body 7 can be provided with a seal 12 with which the lining is sealed off with respect to the vessel. By providing a seal at this point, the influence of pollutants originating both from the vessel and from the environment is restricted as far as possible. Leg 6 provides the connection with bag 3. Fastening ring 4 consists of an upper part 13 which is preferably made from metal in order to simplify folding and to impart a certain rigidity. This ring also consists of a lower part 14 which consists of a plastic material to which bag 3 can easily be affixed. Leg 6 is provided with a screw thread for receiving a plug 5 so that it is possible to seal vessel 2.

After the lining 1 has been fitted in the manner of Figs 3 and 4, the bag 3, after the vessel 2 has been filled, will lie against the wall of the latter, as appears partly in Fig. 1. After the vessel has been used and if it is desired to replace the lining, the lining can be taken out simply by undoing the fold connection at the mouthpiece 10. In this case, a particular feature is that stopper 5 can still be fastened in the fastening ring so that the lining can be removed from the vessel in the sealed condition without any spillage. Next, a new lining can be installed, possibly provided with a further stopper 5, so that it is possible to use the vessel again. If a sealing stopper is still present at the time of installation, the condition of the inside of the bag can be guaranteed.

Although the invention is illustrated hereinabove on the basis

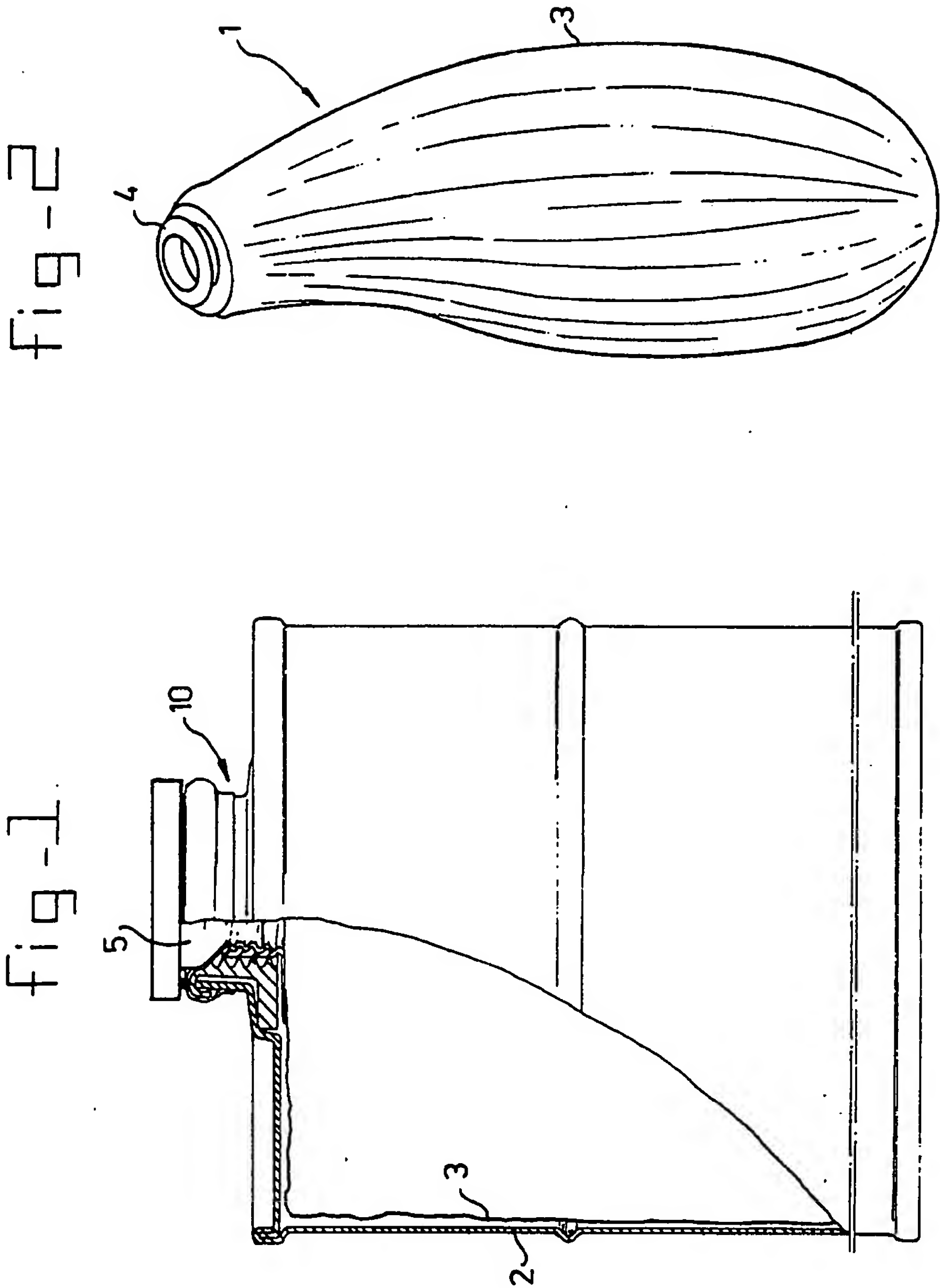
of an illustrative embodiment, it must be understood that numerous modifications may be made thereto without departing from the scope of the present application. It is possible to use the above-described lining in any type of vessel, whilst the fastening of the bag to the fastening ring  
5 4 can also be constructed in a manner other than that illustrated.

CLAIMS

1. Lining (1) which can be installed in a vessel and removed therefrom, comprising a flexible expandable bag (3) intended to lie against the wall of the vessel, and which is fastened to a rigid fastening ring (4) near the mouth of the latter, which ring can be fastened to the vessel and is provided with means for detachably fitting a sealing stopper (5), characterised in that the fastening ring (4) comprises a U-shaped part, one leg (6) thereof being fastened to the bag, the body (7) thereof being designed to lie against the upper edge (8) of a projecting mouthpiece (10) of the vessel, and the other leg being designed to lie against the mouthpiece (10).
2. Lining according to Claim 1, the other leg (9) being fastened to the mouthpiece (10) by folding.
3. Lining according to one of the preceding claims, the fastening ring (4) consisting of metal material.
4. Lining according to one of the preceding claims, the upper part (13) consisting of a metal material and the lower part (14) of plastic, and the flexible bag consisting of a plastic which can easily be connected to the lower part of the ring.
5. Lining according to one of the preceding claims, the fastening ring being provided with an internal screw thread (11) for receiving the sealing stopper.
6. Lining according to one of the preceding claims, the body (7) of the fastening ring (4) being provided with sealing means (12).
7. System for fitting a lining in a vessel, comprising the provision of a lining according to one of the preceding claims, the fitting via an opening in the vessel of the bag, followed by the fastening ring of the lining, and the fastening of a leg of the fastening ring to the mouthpiece of the vessel by folding.
8. System comprising a lining according to one of the preceding claims, as well as a vessel, characterised in that the vessel is a standard vessel provided with at least one mouthpiece (10).

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2/2

fig - 3

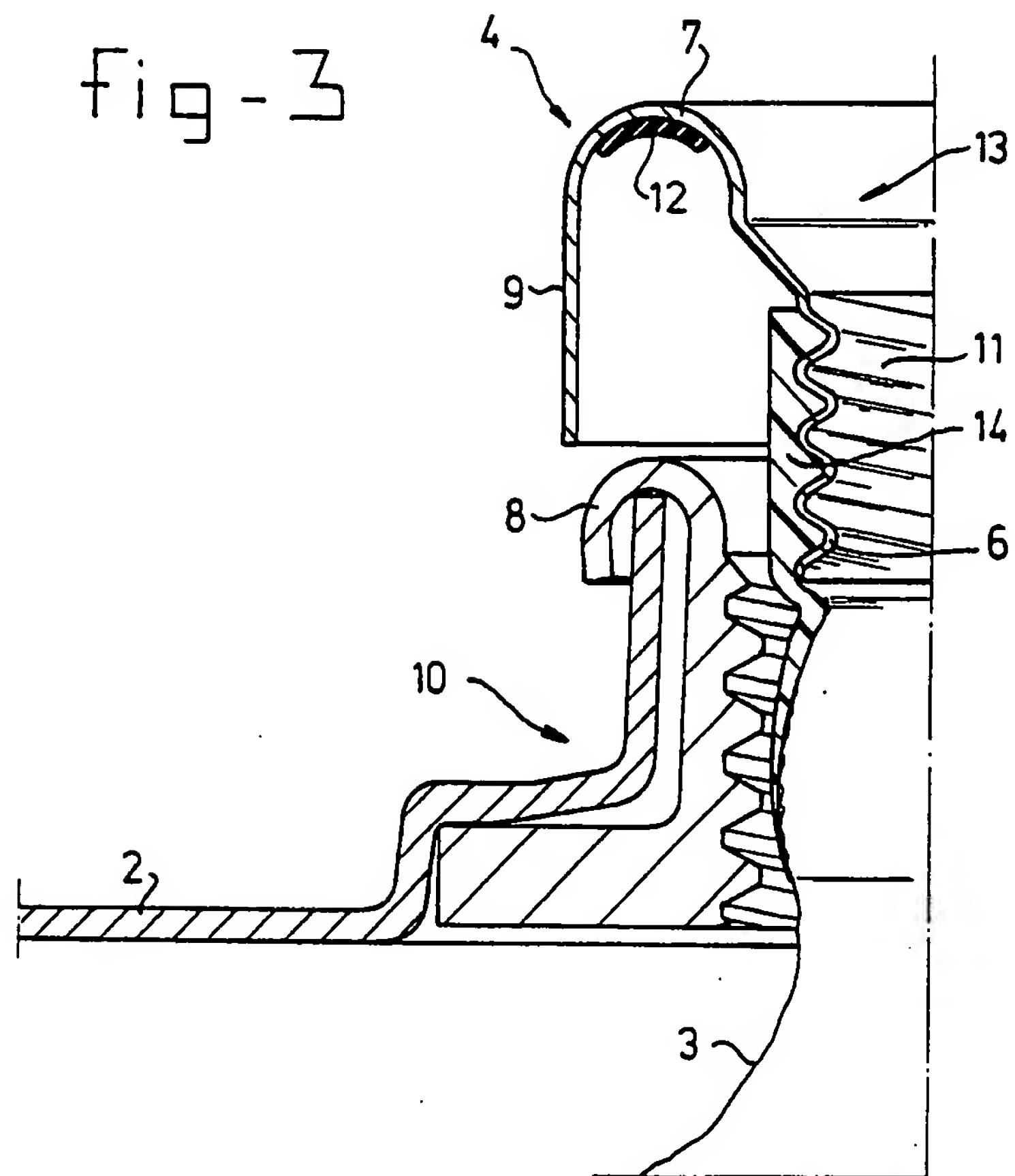
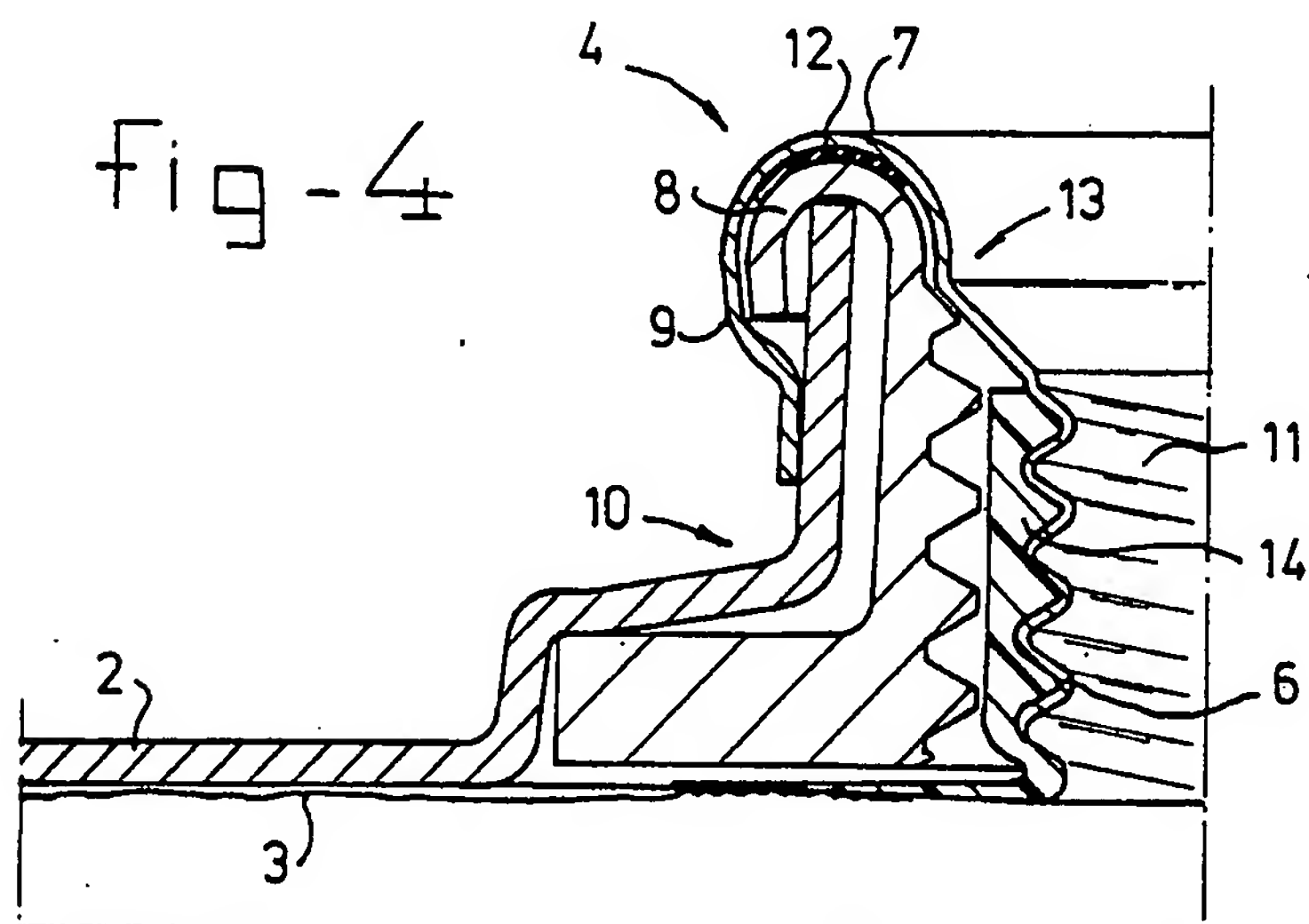


fig - 4



## INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 93/00027

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 B65D25/16		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
Int.Cl. 5	B65D ; B67D	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b>		
Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
A	DE,U,8 908 270 (STENGEL) 28 September 1989 see page 5, line 17 - line 30; figure ---	1,7
A	FR,A,2 624 107 (MULLER) 9 June 1989 see page 3, line 24 - page 4, line 19; figures 1-3 ---	1,3,7
A	FR,A,2 112 854 (COMPAGNIE INDUSTRIELLE DE NEUVILLE) 23 June 1972 see page 2, line 28 - page 3, line 13; figures 1-12 --- -/--	1,7
<p><sup>10</sup> Special categories of cited documents : <sup>10</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
28 APRIL 1993	19. 05. 93	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	VANTOMME M.A.	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category °	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	WO,A,8 808 401 (REAEDON) 3 November 1988 cited in the application see page 6, line 2 - page 9, line 19; figures 1-7 -----	1,7,8

**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.**

NL 9300027  
SA 69919

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.  
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-U-8908270	28-09-89	DE-C- 3918804	02-08-90
FR-A-2624107	09-06-89	CH-A- 674503	15-06-90
		DE-A- 3838182	15-06-89
FR-A-2112854	23-07-72	None	
WO-A-8808401	03-11-88	None	